UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,822	04/05/2006	Gerard Olivier	281470US2XPCT	8916

22850 7590 07/19/2010

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
KWON, ASHLEY M	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
07/19/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/560,822	OLIVIER ET AL.	
	Examiner	Art Unit	
	ASHLEY KWON	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *December 2, 2009*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Amendment

In response to the amendment received December 2, 2009:

a. Claims 10-26 are pending;

b. Previously withdrawn claims 19-26 have been rejoined in light of the petition decision on 2/22/2010;

c. Claims 10 and 21-26 have been amended;

d. The 35 USC 112 rejection of claims 10-18 has been withdrawn in light of applicant's amendments;

e. New rejections have been applied to the claims in light of applicants amendments and arguments.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites the limitation "conductive connections" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

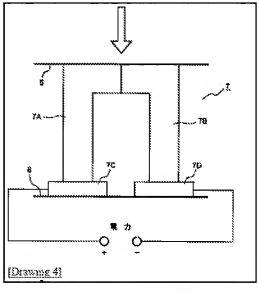
The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

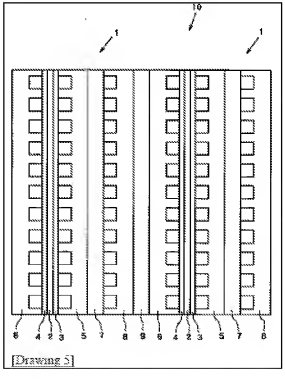
Claims 10-12, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the machine translation of JP 2002-141077 (hereinafter "Shirai") in view of US 5,959,240 (hereinafter "Yoshida").

Regarding claim 10, Shirai discloses a fuel-cell stack (10), comprising: at least two adjacent elementary cells (1) capable of an exothermic combustion reaction constituting a heat source, the exothermic combustion reaction includes an oxidizer and a reactant, and the reactant and the oxidizer circulate within each elementary cell ([0008]-[0009]); an internal duct formed between the cells for circulation of a cooling fluid constituting a cold sink (field plate for cooling agent, 8); and a thermoelectric module (7, see drawing 4), each comprising a pair of elements of two conductive materials of dissimilar nature (p-type semi conductor 7A, n-type semiconductor 7B), a

first end of the pair being in thermal contact with one of the heat source (oxygen pole side field plate, 5) or the cold sink (field plate for cooling agent, 8), a second end of the pair being in contact with the other of the heat source or cold sink, and being electrically connected to a neighboring thermoelectric module (see drawing 5).



[Drawing 4]



[Drawing 5]

Shirai fails to disclose a plurality of thermoelectric modules. However, it is well known in the art for a thermoelectric power generator module to comprise a plurality of thermoelectric elements. For example, Yoshida teaches a thermoelectric power generator 1 module with a plurality of thermoelectric elements 2 made of P-type semiconductor and N-type semiconductor combined to form a thermoelectric element module 21 (see fig. 1; see col. 2 lines 40-56). The simple substitution of one known element for another is likely to be obvious when predictable results are achieved. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. __,__, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, B.). Therefore it would have been obvious to one of ordinary skill in the art that instead of a thermoelectric element, a plurality of thermoelectric elements could be used in order to increase the power density produced by the thermoelectric module.

Regarding claim 11, Shirai in view of Yoshida disclose the fuel-cell stack according to claim 10, wherein the first end of the pair is connected with a conductive thermal contact to a bipolar plate of the heat source (*Shirai:* oxygen pole side field plate, 5), and the second end of the pair is in a thermal contact with the cold sink (*Shirai:* field plate for cooling agent, 8) (*Shirai:* see drawing 5).

Regarding claim 12, Shirai in view of Yoshida disclose the fuel-cell stack according to claim 10, wherein the two conductive materials of the thermoelectric modules are semiconductor materials, a first of P type and a second of N type.

Regarding claim 15, Shirai in view of Yoshida fail to disclose the fuel-cell stack according to claim 10, wherein a last thermoelectric module of an assembly disposed

along a first elementary cell is electrically connected in series or in parallel with a first thermoelectric module of an assembly disposed along a second elementary cell.

However, the Supreme Court decided that a claim can be proved obvious merely by showing that the combination of known elements was obvious to try. In this regard, the Supreme Court explained that, "[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill in the art has a good reason to pursue the known options within his or her technical grasp." An obviousness determination is not the result of a rigid formula disassociated from the consideration of the facts of the case. Indeed, the common sense of those skilled in the art demonstrates why some combinations would have been obvious where others would not. Therefore, choosing from a finite number of identified, predictable solutions, with a reasonable expectation for success, is likely to be obvious to a person if ordinary skill in the art. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. __,__, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, E.). It is well known in the art that fuel cells may be connected in series or in parallel to increase either the current or the voltage of the fuel cell system. Since the goal of this device is to produce electricity, it would have been obvious to a person of ordinary skill in the art that the thermoelectric modules of different fuel cells be connected in series or in parallel to increase either the current or the voltage of the electricity produced.

Regarding claim 16, Shirai in view of Yoshida discloses the fuel-cell stack according to claim 10, wherein a plate forming a wall equipped with a fin is disposed on an external surface of the assembly of thermoelectric modules on a same side as the

internal cooling duct. Yoshida teaches that if a cooling fin 13 (see fig. 5) is arranged at a cold side of the thermoelectric power generator module 1, it is possible to improve a heat exchanging efficiency and maintain a still larger temperature difference (see col. 3, lines 48-53). It would have been obvious to one of ordinary skill in the art to include a plurality of cooling fins in order to further improve the heat exchanging efficiency and maintain an even larger temperature difference.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of Yoshida as applied to claims 10 and 12 above, and further in view of US 6,096,964 (hereinafter "Ghamaty") .

Regarding claim 13, Shirai in view of Yoshida fail to teach the fuel-cell stack according to claim 12, wherein the N-type materials are alloys of silicon and germanium doped with phosphorus and the P-type materials are alloys of silicon and germanium doped with boron.

However, Ghamaty teaches thermoelectric elements, N and P-type samples consisting of silicon and germanium alloys, with the N-type doped with phosphorous and the P-type doped with boron (see col. 4, lines 18-20; col. 4, lines 40-41). Ghamaty teaches that a good thermoelectric material is measured by its "figure of merit", or Z, defined as: $Z = S^2 / \rho K$, where S is the Seebeck coefficient, ρ is the electrical resistivity, and K is the thermal conductivity. Good thermoelectric materials have large values of S and low values of ρ and K, which results in a high Z value as well (see col. 1, lines 15-30). The selection of a known material, which is based upon its suitability for the

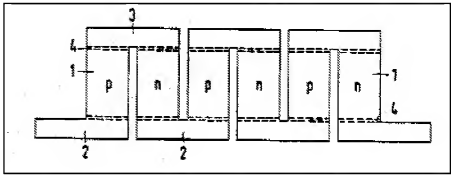
intended use, is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07). A person of ordinary skill in the art would have found it obvious to use N-type materials that are alloys of silicon and germanium doped with phosphorus and P-type materials that are alloys of silicon and germanium doped with boron since silicon germanium alloys are well known to have high Z values, in order to improve the thermoelectric materials (see col. 4, lines 49-50).

Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of Yoshida as applied to claim 10above, and further in view of US 3,470,033 (hereinafter "Szabo de Bucs").

Regarding claim 14, Shirai in view of Yoshida fail to teach the fuel-cell stack according to claim 10, wherein the conductive connections connecting the ends of the materials are composed of molybdenum electrodes.

However, Szabo de Bucs teaches a thermoelectric device whose legs are interconnected by contact bridges (2, 3) composed of an alloy of silicon with molybdenum (see col. 4, lines 57-61; see the figure). The selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07). A person of ordinary skill in the art would have found it obvious to use molybdenum in the conductive connections connecting the ends of the N and P-type materials because the metallic component provided by molybdenum contributes to securing a particularly high mechanical strength, high resistance to breaking, and high

stability with respect to changes in temperature to the contacting bond (*Szabo de Bucs:* see col. 3, lines 18-22).



Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of Yoshida.

Shirai in view of Yoshida discloses a method for partial recuperation of thermal energy originating from a fuel-cell stack, comprising: producing a first electrical energy and a heat energy from the fuel-cell stack; circulating a cooling fluid in an interior between two elementary cells of the fuel-cell stack to place the cooling fluid in thermal contact with a first side of a plurality of thermoelectric modules attached to the fuel-cell stack; heating a second side of the plurality of thermoelectric modules with the heat energy; and generating a second electrical energy by a Seebeck effect ([0035], [0009]).

Claim18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of Yoshida as applied to claim 17 above, and further in view of US 3,964,930 (hereinafter "Reiser").

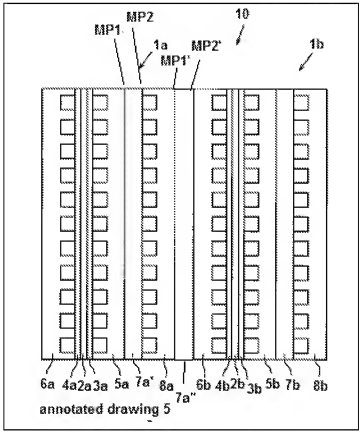
Regarding claim 18, Shirai in view of Yoshida fail to disclose the method according to claim 17, wherein cooling of the cell stack is two-phase.

However, Reiser discloses a fuel cell cooling system wherein heat produced by the cells changes a portion of the water used to cool the cell to steam (i.e. two phase cooling). The liquid water retained is circulated through the cooling system while the steam is used elsewhere (see col. 6, lines 3-10). The use of a known technique to improve similar devices (methods or products) in the same way is likely to be obvious. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. __,__, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, C.). Therefore, it would have been obvious to one of ordinary skill in the art to utilize two-phase cooling in the invention of Shirai in view of Yoshida in order to more efficiently cool the cell stack by utilizing the steam produced.

Claims 19-22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of Yoshida.

Regarding claim 19, Shirai in view of Yoshida discloses a fuel-cell stack (*Shirai:* 10), comprising: a plurality of fuel-cells electrically connected and configured to produce a first electrical power and heat from a reaction between an oxidizer and a reductant reactant (*Shirai:* [0008]-[0009]), the plurality of fuel-cells including a first fuel-cell (*Shirai:* 1b) and a second fuel-cell (*Shirai:* 1a); a first plate configured to transfer heat (*Yoshida:* 3, *annotated drawing 5:* MP1'); a first thermoelectric module layer (7a") configured to produce a second electrical power and the first thermoelectric module layer is disposed between and attached to the first plate and the first fuel-cell. For the purposes of this

rejection, all of the plates labeled as metal plates 3 by Yoshida (*annotated drawing 5:* MP1') will be interpreted comprising said "first plate".



annotated drawing 5

Shirai in view of Yoshida fails to disclose a second plate configured to transfer heat; a second thermoelectric module layer configured to produce a third electrical power and the second thermoelectric module layer is disposed between and attached to the second plate and the second fuel-cell; and an internal duct passageway configured to circulate cooling fluid and to bring the cooling fluid in contact with both the first plate and the second plate, and the internal duct passageway is disposed between the first plate and the second plate.

However, Shirai teaches that although the embodiment described contains a thermoelectric element adjacent to the oxygen pole side field plate, the thermoelectric element could also be placed on the opposite side adjacent to the fuel electrode side field plate. Heat generated with the oxygen electrode transmits to the fuel electrode so there is a rise in heat on the fuel electrode side as well ([0029]). Thus Shirai teaches that the thermoelectric element, which transforms thermal energy into electrical energy, can be combined with either the oxygen pole side field plate or the fuel electrode side field plate ([0035]). A rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. __,__, 82 USPQ2d 1385, 1395 (2007) (see MPEP §§ 2143 and 2143.02). Therefore it would have been obvious to one of ordinary skill in the art that a thermoelectric element could be placed on **both** the oxygen pole side field plate and the fuel electrode side field plate since it is known in the prior art for a thermoelectric element to be placed on either side. One skilled in the art would realize that by placing the thermoelectric element on both sides one would be able to more efficient convert the heat generated by the fuel cell into electrical energy since heat is gathered from the fuel and oxygen electrode sides. See annotated drawing 5 above.

Furthermore, Shirai teaches that when a fuel cell stacks consists of three or more fuel cells, a thermal break (9) is preferred between each generating cell. However, Examiner would like to point out that a preferred embodiment is not the only embodiment possible. One of ordinary skill in the art would realize that if a thermoelectric element is placed on **both** the oxygen pole side field plate and the fuel electrode side field plate, the thermal break (9) is unnecessary since one would want to gather heat from adjacent fuel cells in order to increase the temperature difference at opposite ends of the thermoeletric element (see annotated drawing 5).

Annotated drawing 5 above depicts a second plate (MP2) configured to transfer heat; a second thermoelectric module layer (7a') configured to produce a third electrical power and the second thermoelectric module layer is disposed between and attached to the second plate (MP2) and the second fuel-cell (1a); and an internal duct passageway (8a) configured to circulate cooling fluid and to bring the cooling fluid in contact with both the first plate (MP1') and the second plate (MP2), and the internal duct passageway is disposed between the first plate and the second plate.

Regarding claim 20, Shirai in view of Yoshida discloses the fuel-cell stack according to claim 19, wherein each of the plurality of fuel-cells comprises:
a cathode bipolar plate (5) configured to be a cathode, the cathode bipolar plate having a first cathode surface and a second cathode surface, the second cathode surface having a first engraved duct to carry the oxidizer; an anode bipolar plate (6) configured to be an anode, the anode bipolar plate having a first anode surface and a second anode surface, the first anode surface having a second engraved duct to carry the

reductant reactant; and a porous membrane (2) configured to allow electrically-charged ions to pass between the anode bipolar plate and the cathode bipolar plate, and the porous membrane is in contact with the second cathode surface and the first anode surface. The first and second surfaces of the cathode and anode bipolar plates will be interpreted as opposites of plates 5 and 6.

Regarding claim 21, Shirai in view of Yoshida discloses the fuel-cell stack according to claim 20, wherein the first plate and the second plate each include a cooling fin extending into the internal duct passageway.

Yoshida teaches that if a cooling fin 13 (see fig. 5) is arranged at a cold side of the thermoelectric power generator module 1, it is possible to improve a heat exchanging efficiency and maintain a still larger temperature difference (see col. 3, lines 48-53). It would have been obvious to one of ordinary skill in the art to include a plurality of cooling fins in order to further improve the heat exchanging efficiency and maintain an even larger temperature difference.

Regarding claim 22, Shirai in view of Yoshida discloses the fuel-cell stack according to claim 21, wherein the first thermoelectric module layer (7a") comprises a pair of dissimilar conductive materials (p and n type semiconductors) and each of the dissimilar materials include a heat conductor end configured to be in a conductive thermal contact with the second anode surface (6b) and to conduct heat away from the second anode surface, and a heat dispenser end configured to be connected to the first plate (MP1') and to dispense heat to the first plate.

Regarding claim 25, Shirai in view of Yoshida discloses the fuel-cell stack according to claim 21, wherein the second thermoelectric module layer (7a') comprises a pair of dissimilar conductive materials (p and n type semiconductors) and each of the dissimilar materials include a heat conductor end configured to be in a conductive thermal contact with the first cathode surface (5a) and to conduct heat away from the first cathode surface, and a heat dispenser end configured to be connected to the second plate (MP2) and to dispense heat to the second plate.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of Yoshida as applied to claim 22 above, and further in view of Ghamaty.

Regarding claim 23, Shirai in view of Yoshida fail to disclose the fuel-cell stack according to claim 22, wherein the pair of dissimilar conductive materials are made of two materials including a P-type semiconductor material of silicon and germanium doped with boron, and a N-type semiconductor material of silicon and germanium doped with phosphorus.

However, Ghamaty teaches thermoelectric elements, N and P-type samples consisting of silicon and germanium alloys, with the N-type doped with phosphorous and the P-type doped with boron (see col. 4, lines 18-20; col. 4, lines 40-41). Ghamaty teaches that a good thermoelectric material is measured by its "figure of merit", or Z, defined as: $Z = S^2/\rho K$, where S is the Seebeck coefficient, ρ is the electrical resistivity, and K is the thermal conductivity. Good thermoelectric materials have large values of S and low values of ρ and K, which results in a high Z value as well (see col. 1, lines 15-

30). The selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07). A person of ordinary skill in the art would have found it obvious to use N-type materials that are alloys of silicon and germanium doped with phosphorus and P-type materials that are alloys of silicon and germanium doped with boron since silicon germanium alloys are well known to have high Z values, in order to improve the thermoelectric materials (see col. 4, lines 49-50).

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of Yoshida as applied to claim 23 above, and further in view of Szabo de Bucs.

Regarding claim 24, Shirai in view of Yoshida fail to disclose the fuel-cell stack according to claim 23, wherein a plurality of molybdenum electrodes connect the ends of the pair of dissimilar materials.

However, Szabo de Bucs teaches a thermoelectric device whose legs are interconnected by contact bridges (2, 3) composed of an alloy of silicon with molybdenum (see col. 4, lines 57-61; see the figure). The selection of a known material, which is based upon its suitability for the intended use, is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960) (see MPEP § 2144.07). A person of ordinary skill in the art would have found it obvious to use molybdenum in the conductive connections connecting the ends of the N and P-type materials because the metallic component provided by molybdenum contributes to securing a particularly high mechanical strength, high resistance to breaking, and high

stability with respect to changes in temperature to the contacting bond (*Szabo de Bucs:* see col. 3, lines 18-22).

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai in view of Yoshida as applied to claim 22 above, and further in view of us 2004/0101750 (hereinafter "Burch").

Regarding claim 26, Shirai in view of Yoshida fail to disclose the fuel-cell .stack according to claim 22, wherein the first electric power, the second electric power, and the third electric power are supplied to energize a motor vehicle.

However, it is well known that fuel cell systems are used to supply energy to motor vehicles. For example, Burch teaches that fuel cell systems are used in automobiles and homes ([0001]). Burch also teaches fuel cell system heat exchangers that have thermoelectric devices which also provide further energy to the device it is powering. The combination of familiar elements is likely to be obvious when it does no more than yield predictable results. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. __,__, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, A.). Therefore it would have been obvious to one of ordinary skill in the art that the fuel cell stack taught by Shirai in view of Yoshida could be used to supply energy to a vehicle since it is well known in the art for fuel cell systems to do so.

Response to Arguments

Applicant's arguments with respect to claims 10-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ASHLEY KWON whose telephone number is (571)270-7865. The examiner can normally be reached on Monday to Thursday 7:30 - 6 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ASHLEY KWON/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795